

XI
//
R E M A R K S

ON

TWO CASES OF POISONING BY OPIUM
IN YOUNG CHILDREN.

BY

J. JARDINE MURRAY, M.R.C.S. ENG.,

LATE RESIDENT ASSISTANT TO THE SENIOR PHYSICIAN IN THE ROYAL INFIRMARY,
AND SENIOR PRESIDENT OF THE ROYAL MEDICAL SOCIETY OF EDINBURGH.

EDINBURGH: PRINTED BY MURRAY AND GIBB.

MDCCCLVIII.

[REPRINTED FROM THE EDINBURGH MEDICAL JOURNAL, FEBRUARY 1858.]

REMARKS

ON

TWO CASES OF POISONING BY OPIUM IN YOUNG CHILDREN.

Two from among the cases of poisoning by opium, which occurred while I had charge of the Medical-Accident-Wards in the Royal Infirmary, appear worthy of record. In both the patients were young children, in both the dose was large, and both happily recovered.

CASE I.¹—On the 14th September 1857, shortly after 9 A.M., Daniel Paterson, an infant aged twelve months and a day, was brought to the medical waiting-room of the Royal Infirmary by his parents. The father, an intelligent working-engineer, was already shaking the child and talking loudly in his ears.

The little patient was a well-developed, robust child ; if allowed to remain unmolested for a few moments, he lapsed into a deep sopor, whence he could with difficulty be roused to utter a whimpering cry which was overcome midway by recurring sleepiness ; eyelids closed, pupils upturned, strongly contracted, and little, if at all, influenced by light ; pulse 95, full and soft ; respiration slow, but otherwise natural ; skin cold, particularly over the extremities.

At 7.50 A.M., the father having previously left home for his workshop, the mother took the child from bed to administer to him a dose of tincture of rhubarb. After the medicine had been swallowed, she walked about till he was somewhat pacified, and then replaced him in his crib. Half-an-hour afterwards her attention was arrested by the child's hurried breathing, and by his having fallen into a heavy sleep, unusual at such an hour, and unaccounted for by any previous wakefulness. She called in a neighbour to look at the child, and almost simultaneously was shocked to find that she had given laudanum by mistake. Snatching up her boy, she ran to the nearest surgeon, who advised her to proceed at once to the Infirmary. This she

¹ Published with the sanction of Dr Keiller and the Managers of the Royal Infirmary.

hastened to do, having first called the father from his workshop, which was fortunately not far distant.

No time was lost in endeavouring to excite vomiting, by tickling the fauces with the finger and with a feather, after having administered some mustard in tepid water. These measures being unsuccessful, ten grains of sulphate of zinc were given with more tepid water, and the sponges of Kemp's battery were applied in the course of the phrenic nerve; but all without effect. There was now nothing for it but to use the stomach-pump. A long elastic tube of little more than the calibre of an ordinary catheter (used by Dr Keiller for feeding maniacal patients), was fortunately at hand, and was readily adjusted to the stomach-pump syringe. This I passed down the little patient's œsophagus, and repeatedly injected quantities of milk and tepid water. After each injection, the liquid was removed from the stomach by depressing the tube, which, from its length, acted admirably as a syphon. The tube was then withdrawn, and the child placed in a warmed bed with hot bottles to his feet; hot blankets were applied from time to time, and sensation was kept awake by short shocks from the electro-magnetic-coil apparatus.

1.20 P.M.—Great drowsiness; eyes closed, pupils contracted; pulse full and soft; respiration slow, and occasionally somewhat irregular; skin

Progress. bathed in copious warm perspiration. Taking small quantities of strong coffee with a little spiritus ammoniæ aromaticus. 2.10 P.M.—Has just passed some urine; diaphoresis still copious. Treatment continued. 3 P.M.—There is apparently some little improvement. When roused, his cry is now more decided. 4.20 P.M.—Respiration more frequent. Sensible during short intervals. Skin normal. 6.5 P.M.—More conscious, but much exhausted. Takes his mother's breast. Pupils slightly influenced by light. There is a mucous rattle during respiration, probably due to the secretion having accumulated in the trachea. 11 P.M.—Sleeping quietly; temperature good; pulse and respiration natural.

15th September, 10 A.M.—Pupils act fully under light. The child, on awaking about an hour ago, eagerly applied himself to his mother's breast, and afterwards crowed vigorously at the cat; which favourable symptoms were so much to the satisfaction of the parents that he was forthwith carried home in triumph. During this day he slept much more than usual. Since then he has continued in excellent health.

For his own satisfaction, and at my request, the father ascertained as exactly as possible the quantity of laudanum which had been administered.

Quantity Administered This he asserts to have been 3-4ths of a tea-spoonful, a quantity which was found by experiment to represent not less than 72 drops.

He states that the tincture of opium was purchased of Messrs Duncan and Flockhart, and the label on the phial confirms this statement.

The Tr. Opii of As every preparation sold by Messrs Duncan and Flockhart is Pharmacopœial well known to be prepared with the utmost care, we may conclude that the laudanum in question was of Pharmacopœial

Strength. strength. And to know this is of importance, when we remember that the strength of the tincture, as it is procured of different druggists, varies greatly—(see *Pereira II.*, 3136; also *Lancet*, March 12th, 1853, p. 251). Now as, according to Dr Christison, the proper proportions of opium and spirit are such that "13½ minims, or about 25 drops, contain the active part of one grain of opium" (*Dispensatory*, p. 678), this child has survived the administration of a quantity of laudanum equivalent to three grains of moist opium.

The gravest symptom in the above case was the difficulty of producing vomiting, and this was doubtless due to the physiological action of so large a dose of opium in diminishing the sensibility

and contractility of the digestive organs and muscular system generally.

It is worthy of remark that the symptoms appeared to be alleviated when the cutaneous excretion became copious. I incline to the belief that there is something more than coincidence here, for I have observed the same in several other instances. No doubt, copious perspiration does occur in fatal cases; but certainly these cases do not terminate unfavourably on this account. And though in some cases of poisoning by opium the skin is moist from an early period, I believe that alleviation of the symptoms may be observed when more copious diaphoresis sets in.

Is the opium excreted by the skin? This seems at least probable; for while, under the influence of this narcotic the discharge of every other secretion is impeded, the cutaneous secretion is certainly increased. Both in medicinal and in poisonous doses, opium is a powerful sudorific. It frequently happens that, on a *post-mortem* examination of persons destroyed by opium, no trace of the poison can be obtained—(*Pereira* II., 2104; *Christison on Poisons*, 4th Edit., p. 698.) Either, therefore, the constituents of opium are really present in the dead body, but cannot be detected by any known tests; or they are digestible and assimilable; or they are got rid of by cutaneous excretion. The probability of this last explanation led to the persevering application of relays of hot blankets in the above case; and, as has been already mentioned, very copious diaphoresis was induced, apparently with the best results.

CASE II.—At 11 P.M. on the 19th September 1857, I was called by an engraver-on-wood in this town to see his child, James —, aged seventeen months and two weeks, who had accidentally received a poisonous dose of solution of the Muriate of Morphia.

Labouring under chronic diarrhœa, he had been receiving during the day an occasional tea-spoonful of lime-water, at the recommendation of Mr Colahan, student of medicine, who resided in the house. In the room occupied by this gentleman were a number of six-ounce bottles, from which he was wont to replenish the small phials of his pocket-case for midwifery and dispensary practice. One of these six-ounce phials contained lime-water, and another the solution of the muriate of morphia; and these two clear liquids were unfortunately allowed to stand in juxtaposition on the sideboard. At 7 P.M., the mother gave her child what she believed to be a tea-spoonful of lime-water. About half an hour afterwards, while having his usual warm bath preparatory to being put to bed, she noticed that the child breathed hurriedly and was unusually drowsy. Fearing that some mistake had been committed, she immediately examined the bottles, but was unable to decide from which she had taken the dose. Being alarmed, however, she persevered, with the assistance of her friends, in keeping the child awake. This was becoming a matter of some difficulty at 9 o'clock, when Mr Colahan returned home. He observed that the pupils were very much contracted; and, having heard the mother's account of what had happened, he examined the spoon, which retained the intensely bitter taste peculiar to the salts of morphia. Very properly concluding that the sopor was due to the administration of this drug, he endeavoured to excite vomiting by giving a drachm of Ipecacuan Wine, and repeating the dose at intervals of twenty minutes, till four such doses had been given. Considerable retching followed.

but nothing was rejected from the stomach. At 10.30 p.m., the symptoms being in no degree abated, and the friends becoming very much alarmed, Mr Colaban requested the father to summon me.

11.5 p.m.—The patient was a sickly scrofulous boy. He was fretful, and cross when roused, but exhibited a peculiar facility in going to sleep in any possible position. Features placid and composed; slow, tranquil breathing; pulse feeble and somewhat variable; skin cold and palid; pupils strongly contracted.

As four hours and a half had already elapsed since the administration of the poison, and as no attempt had been made to impede the progress of absorption by distending the stomach with fluid, I considered it unnecessary to employ the stomach-pump. The child was caused to swallow a large quantity of milk and tepid water, a good deal of which was vomited shortly afterwards. From 12 p.m., strong coffee was administered at short intervals; and, as at this time somnolency became extreme, galvanism was employed to keep the child awake. A steady stream of medium strength was kept up, and the sponges were applied to the soles of the feet and to different parts of the body in turn. At 1 a.m. he was placed on his mother's knee before a strong fire; hot blankets were prepared, in which the child's body was closely enveloped, and which were changed at intervals of two or three minutes. In this manner his cold extremities were heated, and he was kept awake. After this treatment had been pursued for an hour, his skin became moist, and in half an hour more he was in a state of profuse perspiration. 2 a.m.—Pupils still very much contracted, and iris insensible to the stimulus of light; pulse 80, weak and full; respiration almost normal. Taking strong coffee at intervals. 5 a.m.—Has vomited a small quantity of liquid matter, apparently coffee. Pupils beginning to act under light. At 7 a.m. the pupils were more dilated, and he was permitted to sleep for ten or fifteen minutes at a time. He was then carefully watched till 11 a.m., at which time narcotism had in a great measure disappeared. The skin, pulse, and respiration were normal; the pupils fully dilated, and the irides acting under light. He afterwards took a little food, and was allowed to fall asleep.

The tea-spoon is one of average size; and, as it was used quite full of the solution, the poor boy must have swallowed an amount equal to a fluid drachm. There was every reason to suppose that the Quantity Administered. solution was of the pharmacopœial strength, since it had been procured at the Old Town Dispensary. But, as about three ounces still remained in the bottle, I was anxious to have this supposition confirmed by analysis, and I am much indebted to the kindness of Professor George Wilson for the trouble he has taken in the matter, as may be seen by the following note:—

“Laboratory of the Industrial Museum of Scotland,
December 14, 1857.

“Jardine Murray, Esq.

“My Dear Sir,—The solution of Muriate of Morphia which you left at this laboratory, was analysed under my directions by my assistant Mr Robert Irvine.

“As it was a little muddy or rather opalescent, it was filtered, and the proportion of Chlorine present in the Muriate of Morphia determined by precipitation with Nitrate of Silver in the usual way. From the amount of Chlorine found, the proportion of Muriate in one liquid ounce of the solution was ascertained to be 4.23 grains; the calculation being made on the assumption that the crystallised salt is $C_{34}H_{19}NO_6, HCl + 6 aq.$

“The officinal solution of the Muriate of Morphia should consist, if I do not mistake, of 4.50 grains of the salt to one ounce of water. The number given above is a little below this; but, if allowance be made for the probability of a little Codeine accompanying the Morphia, and for slight decomposition, indicated by the opalescence or muddiness, the result is sufficient to show that the solution was originally of the proper strength.

"The indirect method of determination described above, was preferred to that of simple evaporation, in consequence of the difficulty of obtaining the evaporated Muriate of Morphia in the same state of crystallization, so far as combination with water is concerned, as it was when employed in the preparation of the solution. For a similar reason, the Morphia was not separated and made the basis of calculation, the per centage of Chlorine admitting of much more precise determination than that of any of the other constituents of the salt.—Yours truly,

"GEORGE WILSON."

As, therefore, the solution was of pharmacopœial strength, and the child received a fluid drachm, he survived a dose equal to 9-16ths of a grain of the crystallised Muriate of Morphia. And as the Solutio Muriatis Morphiæ of the Edinburgh College is equivalent in strength to Laudanum (*Christison*, p. 646), this dose represents very nearly four and a half grains of opium (*Ibid.* p. 678).

Opium seems to have a much greater effect in early than in adult life; and this may be explained by the greater impressibility of the nervous system and the greater rapidity of the circulation. Its uncertainty of action is doubtless often due to particular states of the system, which develop tolerance or intolerance of the drug. For it is well known that, in some forms of chronic pulmonary catarrh, opium is a dangerous remedy to the adult, and doubtless it is at least equally so to the child; while, in colic, large doses may be administered with advantage at all periods of life.† Then, a great deal of the uncertainty of action is due to original peculiarity in the constitution of patients. Thus Dr Christison states (*On Poisons*, 4th Edit., p. 714) that he is acquainted with a gentleman on whom seven drops of laudanum act with great certainty as a hypnotic; and Dr Taylor mentions one case in which half a grain (*On Poisons*, p. 596) and another in which a grain (*Op. cit.*, p. 595) of opium occasioned alarming symptoms in adults. On the other hand, very large doses have frequently been taken without evil consequences. (See *Taylor on Poisons*, p. 597; also, *Christison's Dispensatory*, p. 683.) Now, in all these respects, infants differ from each other as widely as do adults.

Numerous cases might be quoted in which a few minims of laudanum have proved fatal to young children.—(See an article by Professor Beck in *Medical Gazette*, 1843–44, p. 767.) For instance, Dr J. Kelso records a case (*Lancet*, 1837–38, i., p. 304) in which a child nine months old was killed in nine hours by four drops of laudanum. In another case, a child between five and six years of age died in thirty-six hours from having taken an amount of paregoric containing from three quarters of a grain to one grain and a quarter of opium.—(*Guy's Hospital Reports*, April 1844, p. 32.) In a third case, a child aged seven months, was killed by a dose of paregoric, equal to a quarter of a grain of opium.—(*Pharmaceutical Journal*, April 1845, p. 464.) Dr Taylor cites the case of a child, four and a half years old, who was killed, in June 1832, by a dose of four grains of Dover's powder, containing not more than two-fifths of a grain of opium.—(*Guy's Hospital Reports*, 1844, vol. ii., p. 41.)

And Dr Christison mentions an instance in which “the administration of three drops of laudanum in a chalk mixture, for diarrhœa, to a stout child fourteen months old, was followed by coma, convulsions, and death in about six hours.”—(*Op. cit.*, p. 714.)

Unfortunately, children rarely recover from large doses of opium. As far as I am aware, the only authenticated instance on record, where a child has survived such a dose as was administered in the two cases which I have detailed above, is given by Mr Colahan in the *Dublin Medical Press* for April 22, 1846, p. 244. A healthy child, aged nine months, received from its mother twenty-five minims of laudanum to procure sleep. The medical attendant was not summoned till six hours had elapsed; but, by judicious and very energetic treatment, the child's life was saved.